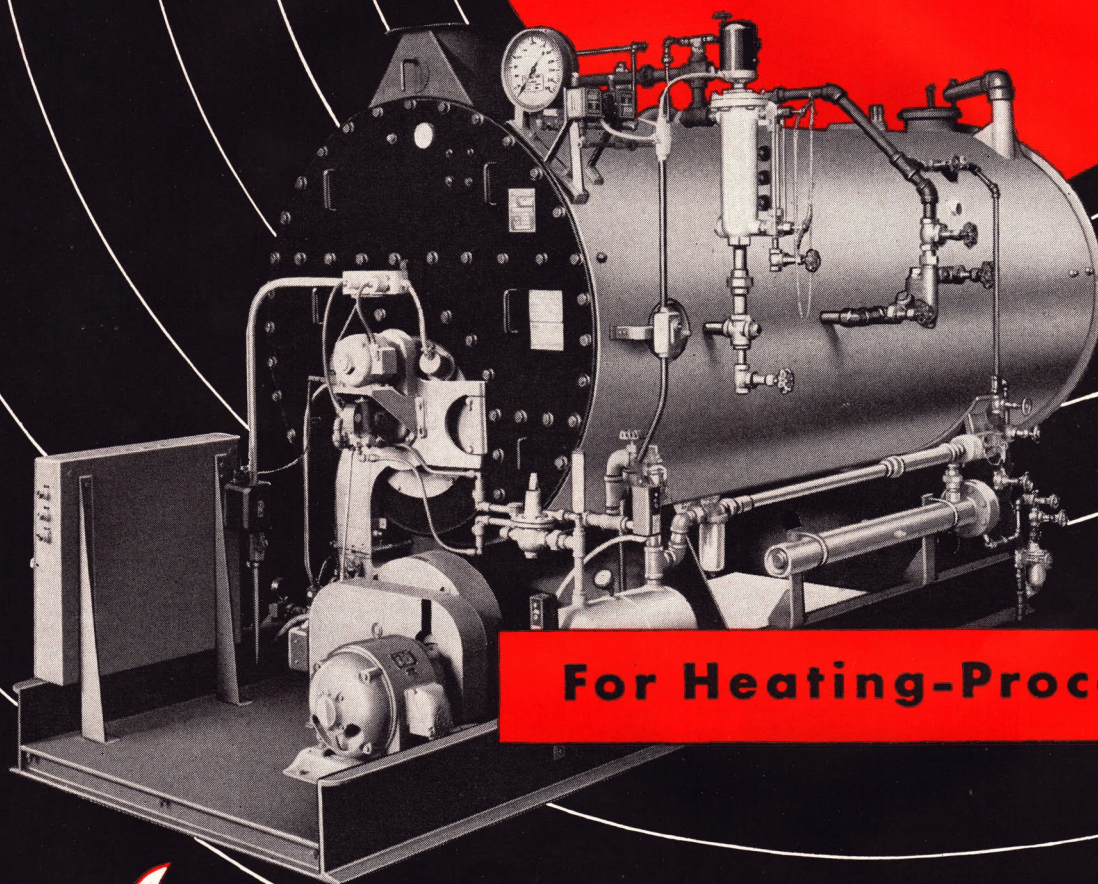


Cleaver-Brooks

Self-Contained

BOILERS



For Heating-Processing



Cleaver-Brooks Company

Milwaukee, Wisconsin, U.S.A.

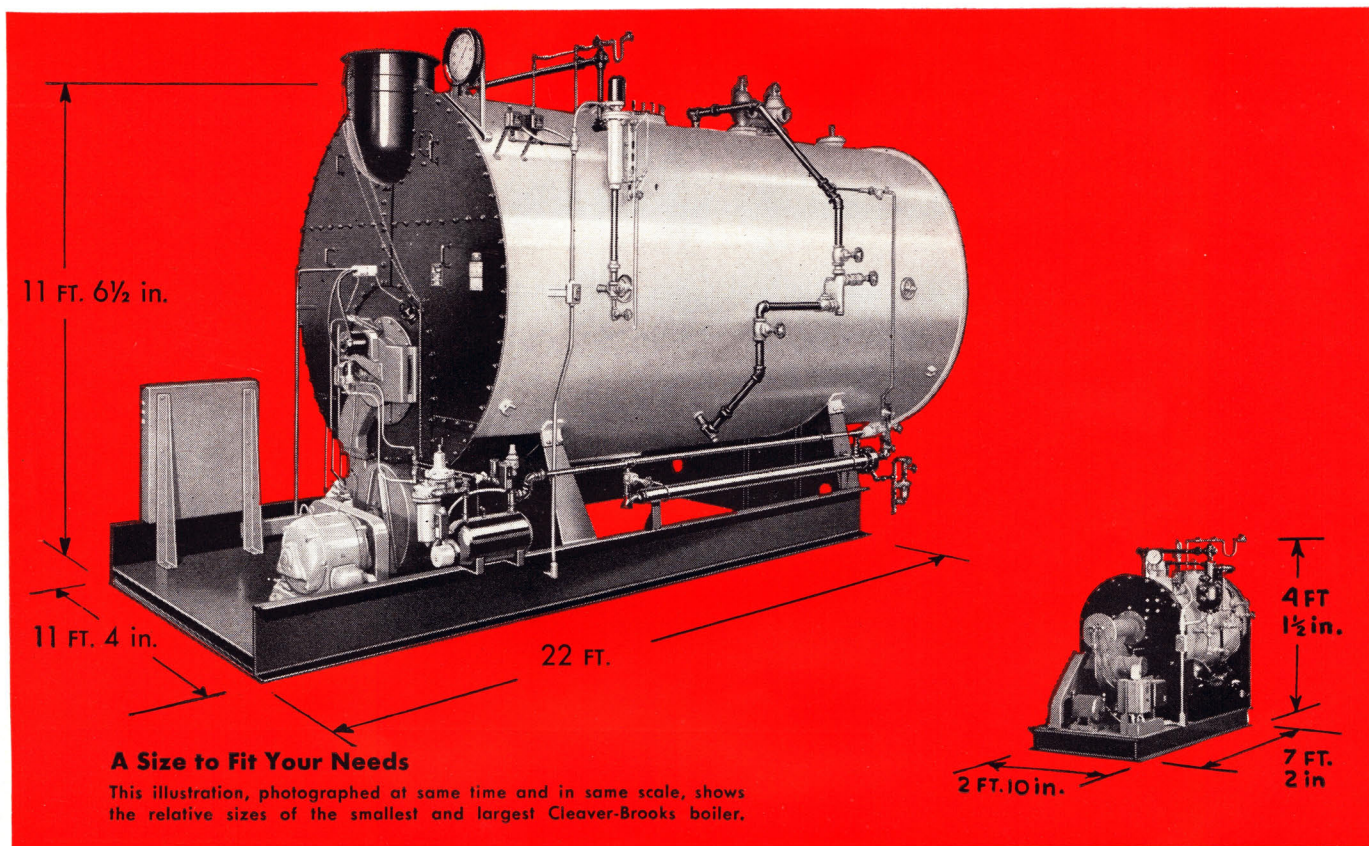
Cleaver-Brooks Self-Contained Boilers

Cleaver-Brooks Self-Contained Boilers—designed to meet industrial and commercial hot water steam requirements. Here is a clean, compact, factory assembled and tested boiler plant ready for operation. Here is a boiler plant that can be easily installed and operated at high efficiency.

The success of the Cleaver-Brooks boiler is proven by the experience of thousands of users who have found

that modern plant design calls for the most modern and efficient boiler design.

Standard Sizes and Fuels — Cleaver-Brooks boilers are made in standard sizes from 15 to 500 horse power and from 15 to 250 psi. Units are equally efficient on any grade of fuel oil up to and including heavy #6 or Bunker C—or any industrial gas, natural, manufactured or mixed.



Plus Values

No Chimney—Combustion gases are carried off through a small vent, eliminating the need of high, costly chimneys.

Compact—You can pack a lot of steam generating capacity into limited space when you install or specify Cleaver-Brooks. These boilers require little floor space and fit easily into low headroom areas.

Fully Automatic—All boilers are fully automatic—smaller sizes have electric spark ignition; larger units equipped with gas pilot, electrically ignited.

Self-Contained—A boiler complete—one source—one responsibility—Cleaver-Brooks units are factory finished, tested under actual load, ready for operation on arrival after connection to service outlets.

Forced Draft—Proper air-fuel ratios are always maintained with forced draft. This means maximum efficiency at all times. Forced draft operates with low electrical loads, provides longer fan life, and requires less maintenance. No problems with high bearing temperatures and corrosion.

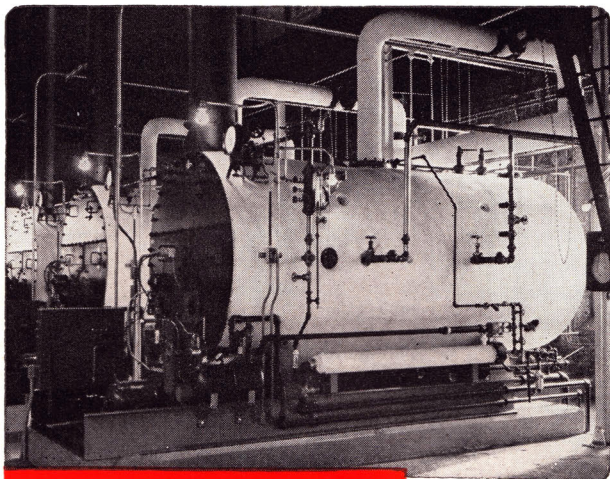
Clean—Because these units burn oil or gas, boiler room and plant are free of soot and eliminate the problem of ash removal.

Fast Installation—No special foundations needed, existing concrete floors will suffice.

Easily Maintained—With normal day to day service, proper water treatment, and reliable operators, maintenance costs for Cleaver-Brooks boilers are a minimum.

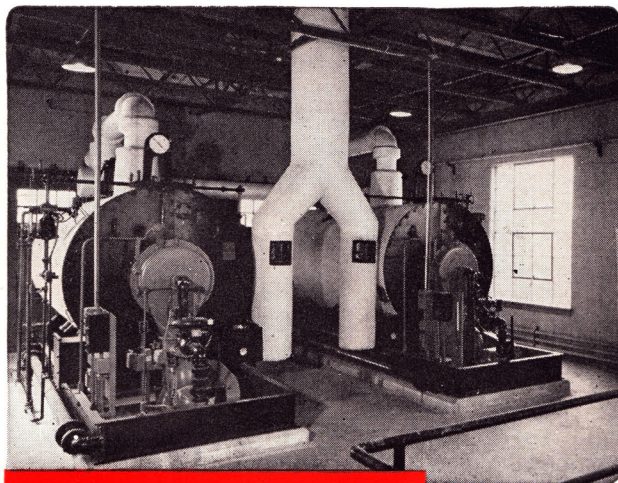
Typical Applications

Dry Steam for Processing—better than 99% quality under actual test—fluctuating process loads do not affect the 80% guaranteed efficiency of a Cleaver-Brooks boiler. A full head of steam in 30 minutes or less.



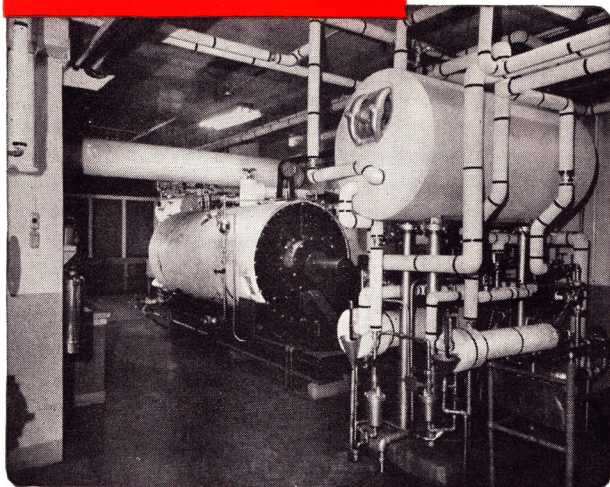
Steam For Processing

Intermittent heating loads are easily handled with a Cleaver-Brooks boiler. Units operate at full efficiency even when operating down to as low as 30% of rated output.



Heating Applications

Large Volume Hot Water Use



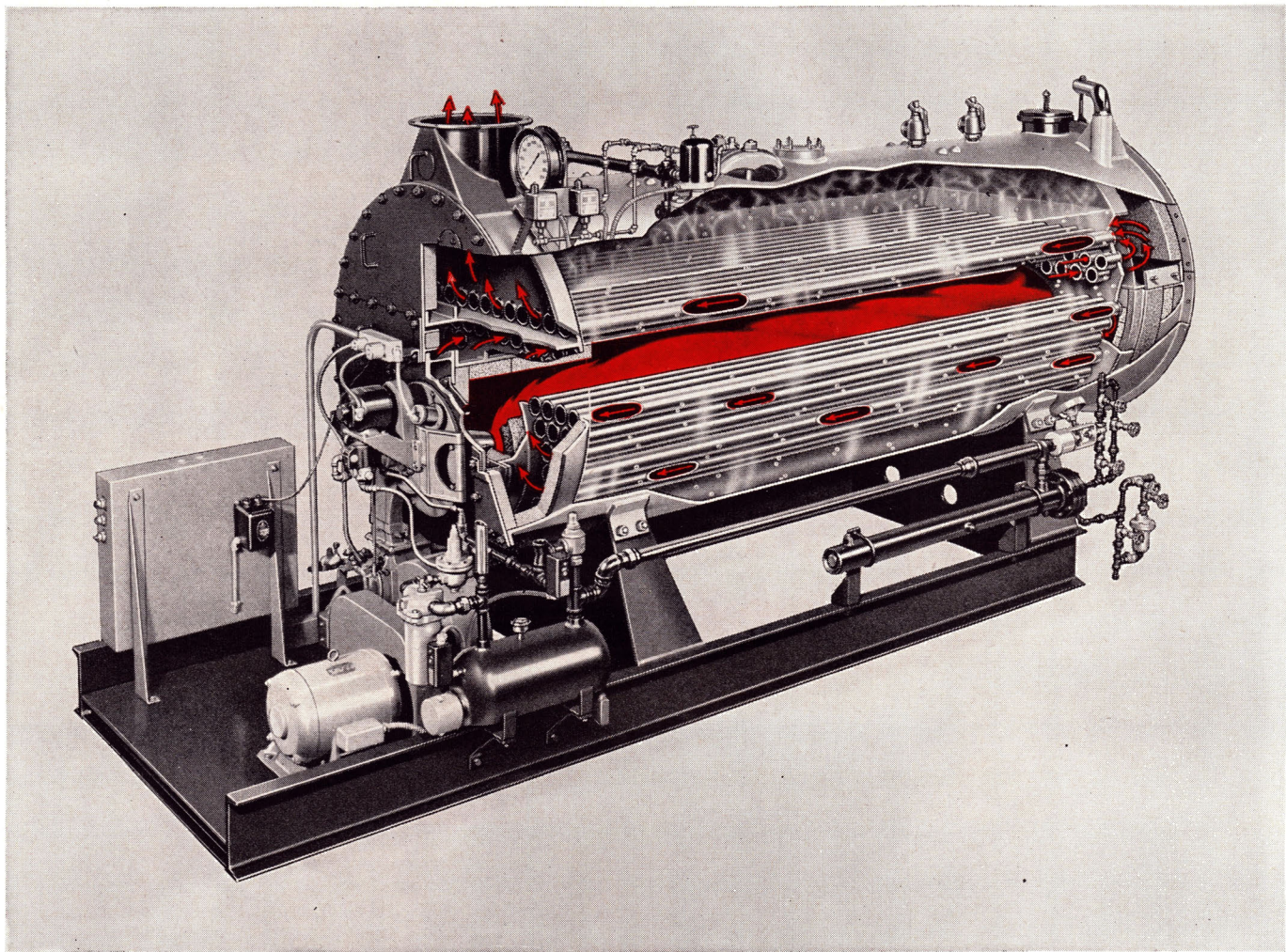
Cleaver-Brooks boilers are readily adaptable to large volume hot water heating. Boilers used with heat exchangers and storage tanks can provide hot water in any quantity—ideal for mass housing or mass feeding hot water applications.

Steam For Special Applications



Mobile Cleaver-Brooks boilers are widely used for construction purposes, such as pile driving, cold weather heating, or thawing operations. Units are completely self-contained, including water and fuel tanks, and powered by gasoline engine.

Four Pass Construction Provides Maximum Heat Transfer—Greater Efficiency



The Cleaver-Brooks self-contained boiler is of the four pass fire tube design. The boiler furnace is of large diameter with liberal heating surface to provide most favorable combustion for all fuels. The combustion gases travel through four successive passes, so as to absorb the maximum quantity of heat from the fuel burned.

Front and rear heads are of sectional design and the refractory lined rear door is supported by a swinging davit. All tube surfaces are readily accessible. Front head of boiler notably free of piping and trim for greater convenience in cleaning and inspection.

Boilers are of all-welded construction meeting the standards

of A.S.M.E. boiler code and burner equipment approved by leading insurance underwriters or recognized national agencies.

All handholes are fitted with steel shroud rings to provide a facing for boiler insulation. Extra heavy brass piping below the water line is installed on all columns and low water cut-off devices. Furnace liner in combustion zone of carborundum refractory.

Burner combustion can be observed through observation ports at both front and rear of boiler, and hinged sight door in exhaust vent enable the operator to observe flue gas conditions.

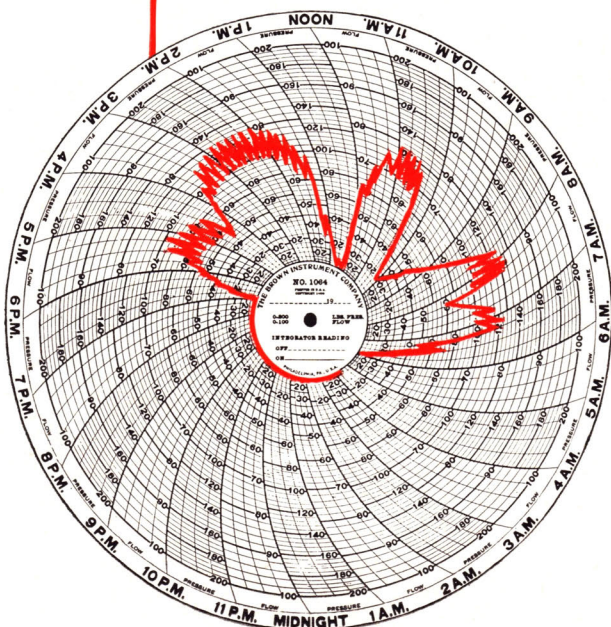
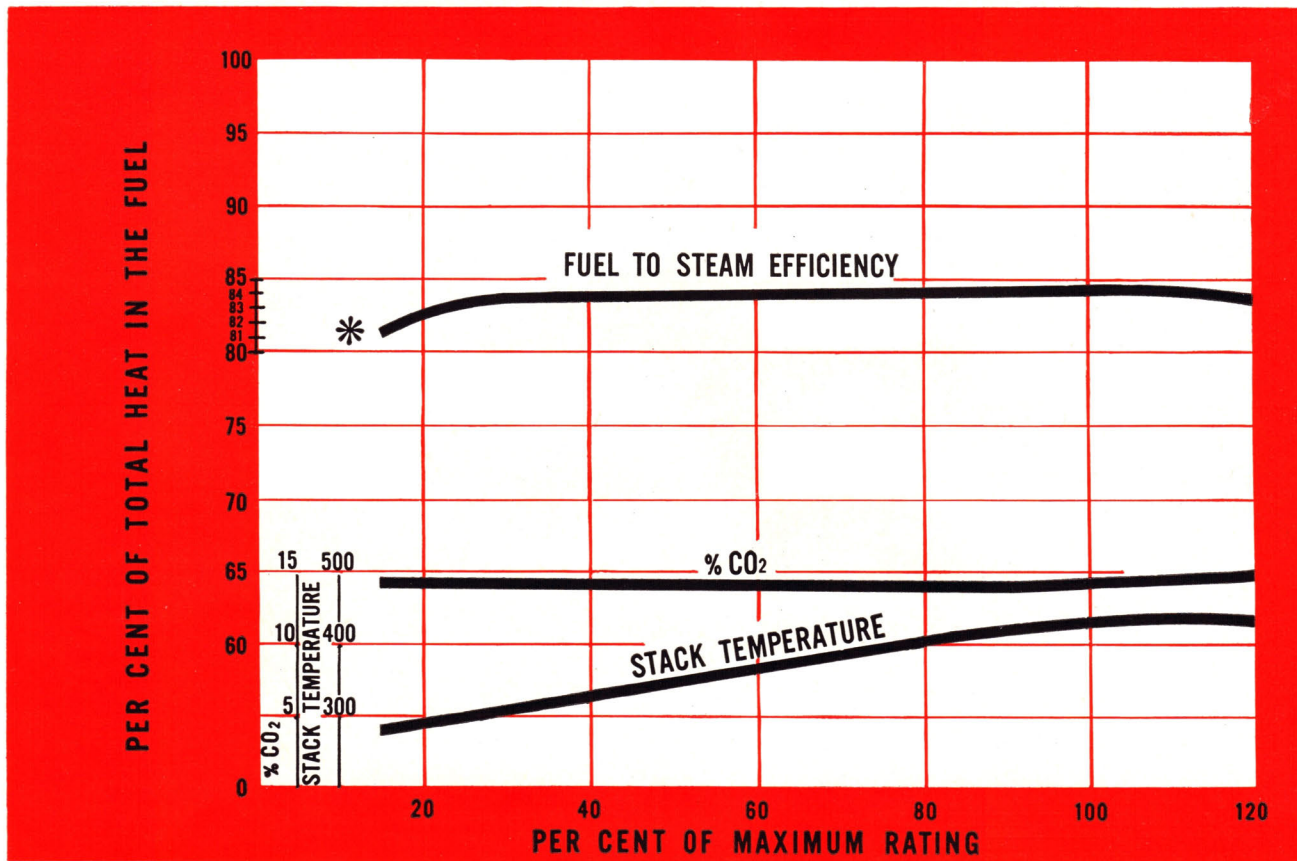
Efficiency

The outstanding feature of the Cleaver-Brooks boiler is its proven high efficiency. Economy of operation is assured by first establishing an efficient flame and then absorbing maximum usable heat in the four passes before the combustion gases leave the boiler.

Cleaver-Brooks Self-Contained Boilers

8a
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*Note that the entire line of Cleaver-Brooks boilers falls within the broad efficiency curve. This high efficiency prevails over a wider and more useful range of boiler capacity than is provided by other types of boilers.



Guaranteed 80% Efficiency

Cleaver-Brooks boilers are guaranteed to operate at a fuel to steam efficiency of not less than 80% and at ratings from 30% to 100% at assigned working pressure. This efficiency will be indicated by a stack temperature approximately 150°F. above saturated steam temperature at the operating pressure, and a stack gas analysis showing approximately 13.5 CO₂ when firing with oil, and 90% of the ultimate CO₂ when firing with gas. Efficiency guarantees are predicated upon boiler shell being insulated.

Fast Steaming

Fluctuating or intermittent steam loads are no problem—whether the demand is heavy or light, steady or variable, the boiler responds instantly and efficiently.

Capacities

Type of Fuel

In specifying type of fuel, remember that models will burn any fuel of a lighter grade as well as the grade indicated. Gas burning units can burn either natural, manufactured, or mixed gases.

Light Oil—defined by Commercial Standard #12-48, and approved by U. S. Dept. Commerce through National Bureau of Standards, as #1 or #2 fuel oil; the latter having a maximum viscosity of 40 SSU @ 100°F. Under the pro-

visions of CS 12-48 there is no longer a fuel oil graded as #3.

No. 5 Oil—defined by Commercial Standard #12-48, is a residual fuel for installations equipped with preheating facilities. It has a maximum viscosity of 800 SSU @ 100°F. or 40 SSF @ 122°F.

No. 6 Oil—defined by Commercial Standard #12-48, is an oil for use in burners equipped with pre-heaters permitting a high viscosity fuel. It has a maximum of 300 SSF @ 112°F.

For Complete Specifications, Firing Rates, etc., write Cleaver-Brooks Company, Milwaukee 12, Wisconsin, or contact the Sales Representative in your area as noted on the back cover of this bulletin.

HP	Type of Fuel	Model Number	lb. Steam per hour from & at 212°F.	Output 1000 B T U	Sq. Ft. EDR (Steam) Gross	EDR Steam Net HP & ACC	Standard Design Pressure	HP	Type of Fuel	Model Number	lb. Steam per hour from & at 212°F.	Output 1000 B T U	Sq. Ft. EDR (Steam) Gross	EDR Steam Net HP & ACC	Standard Design Pressure
15	Light Oil	BF100-1½	515	500	2085		15, 125, 150, 200	150	Light Oil	LR100-15	5200	5020	20,850	17,200	15, 125, 150, 200
	Gas	BF700-1½	515	500	2085				#6 Oil	LR600-15	5200	5020	20,850	17,200	
	L Oil & Gas	BF200-1½	515	500	2085				Gas	LR700-15	5200	5020	20,850	17,200	
30	Light Oil	BF100-3	1050	1000	4170	3440	15, 125, 150, 200	200	L Oil & Gas	LR200-15	5200	5020	20,850	17,200	15, 125, 150, 200
	Gas	BF700-3	1050	1000	4170	3440			#6 Oil & Gas	LR400-15	5200	5020	20,850	17,200	
	L Oil & Gas	BF200-3	1050	1000	4170	3440			Light Oil	LR100-20	6900	6690	27,800	23,000	15, 125, 150, 200
50	Light Oil	LF100-5	1725	1670	6950	5750	15, 125, 150, 200	250	#6 Oil	LR600-20	6900	6690	27,800	23,000	
	#5 Oil	LF500-5	1725	1670	6950	5750			Gas	LR700-20	6900	6690	27,800	23,000	
	Gas	LF700-5	1725	1670	6950	5750			L Oil & Gas	LR200-20	6900	6690	27,800	23,000	
	L Oil & Gas	LF200-5	1725	1670	6950	5750			#6 Oil & Gas	LR400-20	6900	6690	27,800	23,000	15, 150, 200
	#5 Oil & Gas	LF300-5	1725	1670	6950	5750			Light Oil	LR100-25	8600	8365	34,750	28,600	
80	Light Oil	LR100-8	2760	2675	11,120	9200	15, 125, 150, 200	300	#6 Oil	LR600-25	8600	8365	34,750	28,600	
	#5 Oil	LR500-8	2760	2675	11,120	9200			Gas	LR700-25	8600	8365	34,750	28,600	15, 150, 200
	#6 Oil	LR600-8	2760	2675	11,120	9200			L Oil & Gas	LR200-25	8600	8365	34,750	28,600	
	Gas	LR700-8	2760	2675	11,120	9200			#6 Oil & Gas	LR400-25	8600	8365	34,750	28,600	
	L Oil & Gas	LR200-8	2760	2675	11,120	9200		350	Light Oil	LR100-30	10,500	10,040	41,700	34,400	15, 150, 200
	#5 Oil & Gas	LR300-8	2760	2675	11,120	9200			#6 Oil	LR600-30	10,500	10,040	41,700	34,400	
	#6 Oil & Gas	LR400-8	2760	2675	11,120	9200			Gas	LR700-30	10,500	10,040	41,700	34,400	15, 150, 200
100	Light Oil	LR100-10	3450	3345	13,900	11,450	15, 125, 150, 200	400	L Oil & Gas	LR200-30	10,500	10,040	41,700	34,400	
	#5 Oil	LR500-10	3450	3345	13,900	11,450			#6 Oil & Gas	LR400-30	10,500	10,040	41,700	34,400	15, 150, 200
	#6 Oil	LR600-10	3450	3345	13,900	11,450			Light Oil	LR100-35	12,000	11,710	48,650	40,000	
	Gas	LR700-10	3450	3345	13,900	11,450		450	#6 Oil	LR600-35	12,000	11,710	48,650	40,000	15, 150, 200
	L Oil & Gas	LR200-10	3450	3345	13,900	11,450			Gas	LR700-35	12,000	11,710	48,650	40,000	
	#5 Oil & Gas	LR300-10	3450	3345	13,900	11,450			L Oil & Gas	LR200-35	12,000	11,710	48,650	40,000	15, 150, 200
	#6 Oil & Gas	LR400-10	3450	3345	13,900	11,450			#6 Oil & Gas	LR400-35	12,000	11,710	48,650	40,000	
125	Light Oil	LR100-12	4300	4180	17,370	14,300	15, 125, 150, 200	500	Light Oil	LR100-40	13,800	13,388	55,600	45,800	15, 150, 200
	#5 Oil	LR500-12	4300	4180	17,370	14,300			#6 Oil	LR600-40	13,800	13,388	55,600	45,800	
	#6 Oil	LR600-12	4300	4180	17,370	14,300			Gas	LR700-40	13,800	13,388	55,600	45,800	15, 150, 200
	Gas	LR700-12	4300	4180	17,370	14,300			L Oil & Gas	LR200-40	13,800	13,388	55,600	45,800	
	L Oil & Gas	LR200-12	4300	4180	17,370	14,300			#6 Oil & Gas	LR400-40	13,800	13,388	55,600	45,800	15, 150, 200
	#5 Oil & Gas	LR300-12	4300	4180	17,370	14,300			Light Oil	LR100-50	17,000	16,735	69,500	57,300	
	#6 Oil & Gas	LR400-12	4300	4180	17,370	14,300			#6 Oil	LR600-50	17,000	16,735	69,500	57,300	15, 150, 200
	Gas	LR700-12	4300	4180	17,370	14,300			Gas	LR700-50	17,000	16,735	69,500	57,300	
	L Oil & Gas	LR200-12	4300	4180	17,370	14,300			L Oil & Gas	LR200-50	17,000	16,735	69,500	57,300	
	#5 Oil & Gas	LR300-12	4300	4180	17,370	14,300			#6 Oil & Gas	LR400-50	17,000	16,735	69,500	57,300	

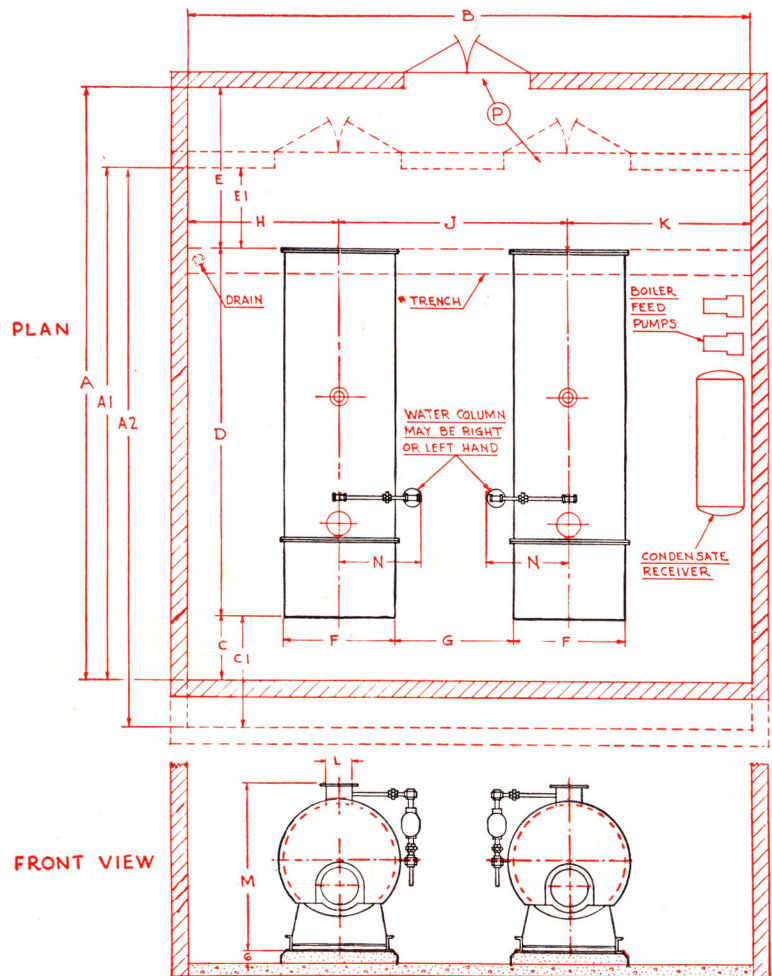
Dimensions

Boiler Room Layout

These plans and dimension drawings will be of substantial assistance in making dependable layouts of your boiler room. The general plan is the result of experience gained in planning hundreds of boiler rooms in many types of industries.

They can be used with equal facility for planning a single or multiple boiler room since dimensions J, H and K are constant. Considerable space may be saved by using dimension A1 and installing doors P for tube cleaning.

*The use of trenching for service lines is desirable in a well designed boiler room. The exact size and location of trenches depend upon point of entry of service lines.



TWO UNIT BOILER ROOM →

H.P. Size	50	80	100	125	150	200	250	300	350	400	500
A	21'-0"	26'-0"	30'-0"	28'-0"	29'-8"	31'-0"	33'-0"	35'-6"	34'-6"	34'-4"	36'-8"
A1	18'-4"	21'-2"	23'-4"	22'-5"	23'-3"	25'-7"	27'-8"	28'-11"	28'-5"	28'-9"	30'-0"
A2	18'-4"	22'-4"	26'-2"	24'-0"	25'-8"	28'-0"	28'-10"	31'-6"	30'-6"	30'-6"	32'-8"
B	24'-0"	26'-0"	27'-0"	29'-0"	30'-0"	31'-0"	35'-0"	35'-0"	36'-0"	37'-0"	38'-0"
C	4'-0"	4'-0"	4'-0"	4'-0"	4'-0"	4'-0"	4'-0"	4'-0"	4'-0"	4'-0"	4'-0"
C1	4'-0"	5'-2"	6'-10"	5'-7"	6'-5"	6'-5"	5'-2"	6'-7"	6'-1"	5'-9"	6'-8"
D	11'-4"	14'-2"	16'-4"	15'-5"	16'-3"	17'-7"	19'-8"	20'-11"	20'-5"	20'-9"	22'-0"
E	5'-8"	7'-10"	9'-8"	8'-7"	9'-5"	9'-5"	9'-4"	10'-7"	10'-1"	9'-7"	10'-8"
E1	3'-0"	3'-0"	3'-0"	3'-0"	3'-0"	4'-0"	4'-0"	4'-0"	4'-0"	4'-0"	4'-0"
F	3'-6"	4'-6"	4'-10"	5'-0"	5'-6"	6'-0"	7'-0"	7'-0"	7'-6"	8'-0"	8'-0"
G	6'-0"	6'-0"	6'-0"	6'-6"	6'-6"	6'-6"	8'-0"	8'-0"	8'-0"	8'-0"	8'-6"
H	6'-0"	6'-0"	6'-0"	7'-0"	7'-0"	7'-0"	8'-0"	8'-0"	8'-0"	8'-6"	9'-0"
J	9'-6"	10'-6"	10'-10"	11'-6"	12'-0"	12'-6"	15'-0"	15'-0"	15'-6"	16'-0"	16'-6"
K	8'-6"	9'-6"	10'-2"	10'-6"	11'-0"	11'-6"	12'-0"	12'-0"	12'-6"	12'-6"	12'-6"
L	10"	12"	12"	15"	16"	18"	20"	20"	24"	24"	24"
M	5'-7"	6'-10"	7'-4"	8'-1"	8'-2"	9'-0"	9'-9"	9'-9"	10'-4"	11'-1"	11'-7"
N	3'-0"	3'-3"	3'-6"	3'-11"	4'-0"	4'-3"	5'-6"	5'-6"	5'-9"	6'-0"	6'-3"
P	4'-6"	5'-0"	5'-6"	6'-0"	6'-6"	7'-0"	8'-0"	8'-0"	8'-6"	9'-0"	9'-6"
	6'-6"	7'-6"	8'-0"	9'-0"	9'-0"	9'-6"	10'-6"	10'-6"	11'-0"	12'-0"	12'-6"

Dimensions, while sufficiently accurate for layout purposes, should be confirmed by certified boiler dimension prints. See next page for Engineering Assistance

Cleaver-Brooks Self-Contained Steam Boilers

Engineering Service

Boiler Selection—Each Cleaver-Brooks boiler is job rated. A competent sales engineer in your area or our Sales Engineering office will help analyze your load demands and take into account the following conditions:

- Maximum steam requirements in pounds per hour or boiler horsepower.
- Whether your steam load is constant or fluctuating, and the degree of fluctuation.
- The heating load requirements.
- Standby requirements.
- Steam pressure required at point of use.
- Future growth or expansion of plant facilities.
- Pop valve settings.
- Per cent of total feed water returned as condensate.
- Temperature of condensate.
- Pressure of make-up water.
- Type of fuel available.
- Electric current characteristics.
- Space and machinery arrangement. Suggested boiler room layouts.
- Plant altitude above sea level.

Shop Tests—Every boiler receives shop tests prior to shipment for the purpose of checking general operation, determining ratings, and proving of mechanical and electrical controls. Tests can be witnessed by purchaser provided sufficient notice is given the Company prior to shipping date. Following shipment of each new unit, a Manufacturer's Data Report covering tests and inspection is forwarded to the purchaser.

Operating Instructions—Complete operating and maintenance instructions including preliminary installation information are forwarded to the purchaser at the time of shipment.

Starting Service—The purchaser is provided, at no additional cost, the services of a qualified field technician for the starting of the boiler and instructing of operators.

For Complete Specifications, write Cleaver-Brooks Company, Milwaukee 12, Wisconsin, or contact the Sales Representative in your area as shown below.

Sales Representatives

ARIZONA

Phoenix
Boyd Engineering Company, Inc.
1600 West Jefferson

CALIFORNIA

Los Angeles
Heat & Power Equipment Company
2322 Linden Avenue, Long Beach

San Francisco
The Merrill-Brose Company
11th and Howard Streets

CONNECTICUT

Hartford
Wilson C. Blake & Company
190 Beacon Street

DISTRICT OF COLUMBIA

Washington
L. S. Luther & Company
1740 K Street, N. W.

FLORIDA

Jacksonville
Illingworth Engineering Company
406 Hildebrandt Building

Miami

Belcher Oil Company
1217 Biscayne Boulevard

GEORGIA

Atlanta
Applied Engineering Company
500 Piedmont Avenue, N.E.

ILLINOIS

Chicago
Fred W. Kramer & Associates
128-138 S. Paulina Street

INDIANA

Indianapolis
Noah M. Simmons Company
15 North Ritter Avenue

IOWA

Des Moines
E. C. Giberson
3719 Center Street

KENTUCKY

Lexington
Brack-McVey Company
Vine and Southeastern Streets

LOUISIANA

New Orleans
Frank P. Fischer Engr. Company
7924 Maple Street

MARYLAND

Baltimore
L. S. Luther & Company
204 East 25th Street

MASSACHUSETTS

Boston
Frank I. Rounds Company
112 Needham Street, Newtonville

MICHIGAN

Detroit
James H. Comins Sales Engr. Co.
1713 Anita Ave., Grosse Pointe Woods

Grand Rapids

Kress Engineering & Sales Co.
706 Jefferson Street, S. E.

MINNESOTA

Fergus Falls
Allan J. Adelsman Company
P. O. Box 253

Minneapolis

A. X. Nelson & Company
1104 Baker Building

MISSOURI

Kansas City
The Hesler Company
950 Dierks Building

St. Louis

Foley-Schaeffer, Inc.
2515 North 25th Street

NEBRASKA

Omaha
Pasol Engineering Company
4106 Dodge Street

NEW MEXICO

Albuquerque
Boyd Engineering Co., Inc.
112 West Granite Street

NEW YORK

Albany
H. B. Kimmey Company
27 Columbia Street

Buffalo

W. E. Voisinet
250 Delaware Avenue

New York City

James G. Brooks Co., Inc.
50 Church Street, Room 1865

Plattsburgh

H. B. Kimmey Company
59 Bridge Street

Rochester

A. R. Bowman
813 Temple Building
Syracuse
J. W. Stevens Company
1425 Erie Boulevard East

NORTH CAROLINA

Charlotte
Applied Engineering Company
1605 Elizabeth Avenue

OHIO

Cleveland
Dravo Corp. (Machinery Div.)
4810 Prospect Avenue

Columbus

Keatts Thermal Equipment Co.
3851 North High Street

OKLAHOMA

Tulsa
Arduser & Company
317 South Detroit

OREGON

Portland
A. W. Mortensen Company
1409 S. E. Union

PENNSYLVANIA

Philadelphia
Alan A. Wood, Inc.
4610-12 N. 15th Street

Pittsburgh

Dravo Corp. (Machinery Div.)
Dravo Bldg., 5th & Liberty Aves.

SOUTH CAROLINA

Orangeburg
Applied Engineering Company
468 Carolina Avenue, N. E.

TENNESSEE

Knoxville
Tennessee Heating Sales Company
1243 N. Broadway

Memphis

Power Equipment Company
1352 Madison Avenue

Nashville

Foster Engr. & Equipment Co.
212 Woodland Street

TEXAS

Corpus Christi
J. R. Dowdell & Company
108½ N. Chaparral St., Room 209

Dallas

J. R. Dowdell & Company
4024 Swiss Avenue

El Paso

Boyd Engineering Company, Inc.
718 North Stanton Street

Houston

J. R. Dowdell & Company
M & M Bldg., Room 416

UTAH

Salt Lake City
The Lang Company
267 W. First South Street

WASHINGTON

Seattle
Merrill N. Musgrave & Company
2019 - 3rd Avenue

WISCONSIN

Milwaukee
Cleaver-Brooks Company
326 East Keefe Avenue

Ripon

Yates Equipment & Supply Co.
P. O. Box 331

CANADA

Ontario
Waterloo Manufacturing Co.
67 King Street, South, Waterloo

Quebec

Mechanical Appliance & Transmission Co.
5301 Western Avenue, Montreal

NOVA SCOTIA

New Brunswick
E. S. Stephenson & Co., Ltd.
15 Dock Street, St. Johns

HAWAIIAN ISLANDS

Honolulu
Von-Hamm Young Co., Inc.
King & Bishop Streets

MEXICO

Mexico, D.F.
Sociedad Electro-Mecanica, S.A.
Serapio Rendon 84



Cleaver-Brooks Company

326 E. Keefe Ave. Milwaukee 12, Wisconsin